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(54) Abstract Title
Container with thermochromic component

(57) A container for epilatory wax includes a lid, an application device, such as a spatula, or a nozzle connected to the container. There may also be a stirring device or a strip of material, preferably cardboard, included, for dipping into the wax. Any of these may include thermochromic material, which changes colour when the wax is heated to the right temperature for application to the skin. The thermochromic material may be a resin implanted in the plastic container walls, lid, nozzle, spatula or stirrer. Alternatively, a thermochromic ink may be used on the surface of the spatula or strip of material. The thermochromic material may change colour at the melting point of the wax. Two different thermochromic materials may be used, to provide an additional colour change when the wax is too hot for safe application to the skin. A method of removing hair from the body using this apparatus is also disclosed.

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Improvements in or Relating to Packaging

The present invention relates to methods and apparatus for the removal of hair from the mammalian body and, in particular, to the removal of hair from the human body by means of a wax composition.

Various methods of hair removal (epilation or depilation) are known, such as shaving, chemical depilatory preparations which weaken the structure of the hair before physical removal, devices including bent rotating coil springs or the like which act to pluck the hair and waxes applied to the skin which can be peeled away with the hairs embedded therein.

Each of these methods has attendant disadvantages, such as the danger of cutting the skin on shaving, the unpleasant smell of depilatory preparations and the discomfort in use of waxes and coil spring devices. However, waxes are increasing in popularity.

In use, waxes tend to be supplied as generally solid materials which are melted before application. The molten material is applied to the skin, whereat it cools and can then be peeled away together with the unwanted hair. Often, a tool such as a spatula or stirrer, commonly of wood, is provided with the wax composition for applying the composition to the skin.

Wax compositions may conveniently be heated in the container in which they are supplied, for example, by means of a microwave oven or a hot water bath (a so-called "bain-marie"). A particular problem with such wax compositions lies in ensuring that the wax is heated to the correct temperature. If the wax is insufficiently hot, it may not be entirely molten and its effectiveness may be reduced. More seriously, if the wax is too hot, it may cause burns to the skin.

It is therefore desirable to provide a means of ensuring that the wax is at the correct temperature before application to the skin. One method which has been considered is to use a thermochromic liquid crystal ink in a label on the side of the container in which the wax is contained. However, the change in colour of the ink on the label may not most accurately reflect the actual temperature of the wax composition. For example, if the container were to be heated in a water bath, the label on the container of wax would change as a consequence of the temperature of the water, and not the temperature of the wax. Furthermore, thermochromic liquid crystal inks change colour at a precise temperature. Thus, an ink could be selected which would change colour at a substantially precise temperature, for example at 50°C or at 60°C. However, wax can be used safely and effectively over a reasonably broad temperature range, for example between about 44°C and 58°C. Therefore, it would be preferable to be able to determine whether

the temperature of the wax falls within a predetermined temperature range, rather than be able to determine that the wax is at one specific temperature.

It has now been appreciated that by ensuring a more intimate relationship between a thermochromic material and the wax, a more reliable indication of the temperature of the wax can be provided. In addition, by way of the present invention, it is possible to provide a visual indication that the temperature of the wax falls within a defined temperature range, within which the wax may be used safely. Thus, the danger of burning the skin is obviated.

According to a first aspect of the invention there is provided a container for an epilatory wax composition and/or a device for use in conjunction therewith, wherein the container and/or the device includes a thermochromic material adapted to change colour over a predetermined temperature range when in contact with a melting or molten epilatory wax composition.

In a particularly preferred embodiment of the present invention, the said device comprises an applicator adapted to be used to apply the molten wax to the skin.

According to a second aspect of the invention, there is provided apparatus for the removal of hair from the body comprising a container of an epilatory wax composition, which wax is adapted to melt on heating, and a device for use in conjunction therewith, which device is adapted to make contact with the melting or molten wax composition, wherein the device includes a thermochromic material adapted to change colour over a predetermined temperature range when in contact with the wax composition.

According to a third aspect of the invention there is provided a method of removing hair from the body, which method includes the steps of providing a container of wax for epilation, wherein the container and/or a device adapted for use in conjunction therewith is adapted to change colour over a predetermined temperature range; heating the wax until the container and/or device changes colour; applying the wax to the body and removing the wax together with the unwanted hair.

As used in the present specification, the term "wax" refers generally to any composition used for the removal of hair from the body which is initially heated and is then applied to the body in a generally molten state, allowed substantially to solidify and removed from the body with the unwanted hair. Thus, the term includes both true waxes and other materials suitable for epilation, such as compositions based on

resins or compositions based on sugars, in particular glucose.

According to a first embodiment of the present invention, the container for the wax includes a thermochromic material in its lid. The lid of the container will then change colour over a defined temperature range according to the temperature of the wax within the container, following the inversion of the container so that the molten wax is in direct contact with the lid.

According to a second embodiment of the invention, the thermochromic material is included in the walls of the container itself.

In accordance with a most preferred embodiment of the invention, the thermochromic material is included in a separate device adapted for use in conjunction with a container of epilatory wax.

Preferably, the device comprises an applicator. The applicator may, for example, be a spatula made of wood. Alternatively, the applicator may comprise a spatula made of plastics material, especially polystyrene, polyethylene, polypropylene or polycarbonate. The spatula which includes the thermochromic material may then be dipped intermittently into the wax to see whether a change in colour is observed to thereby test the wax

temperature. If the wax is at an appropriate temperature for application to the body, the molten wax can then be applied to the skin using the spatula. Alternatively, the wax can be heated whilst stirring continuously with the spatula. If the colour change of the spatula indicates that the wax is too hot for safe application to the skin, the wax is allowed to cool until the colour of the spatula indicates that the wax has cooled to an appropriate temperature for use.

It is also known to provide a container for wax which consists of a bottle with first and second opposite ends with an applicator provided at the first end to enable the wax to be discharged from the container directly onto the skin of the user. In use, the bottle is subjected to elevated temperature, and the container is then inverted so that the molten wax flows out of the container via the outlet of the applicator and onto the skin. According to a further embodiment of the invention, the thermochromic material is included in such an applicator.

According to a further embodiment of the present invention, the epilatory wax can be used in conjunction with a conventional spatula and the device for use in accordance with the present invention may comprise a further component, for example, an independent stirring means or an independent indicator such as a plastic tester for dipping into the wax.

Alternatively, the device may be placed on to the molten wax in the container. For example, in a further embodiment of the invention, the device may comprise a strip of material, for example a piece of cardboard, which includes a thermochromic material, for example an ink, and is thereby heat-sensitive and able to change colour over a predetermined temperature range. The device can be placed intermittently on top of the wax or rested continuously on the wax as it is heated, until a colour change is noted. Such a device could also be dipped into the wax after heating.

The choice of thermochromic material used in the container for epilatory wax or the device for use therewith in accordance with the present invention is not particularly limited. Clearly, the thermochromic material must change colour within an appropriate temperature range. Wax can be used safely and effectively between about 44°C and 58°C. Above about 58°C, the wax is too hot and could burn the skin. Below about 44°C, the wax becomes too viscous and is difficult to spread. Thus, the thermochromic materials used in accordance with the present invention will have a colour change within a temperature range between about 40°C and 60°C. A most preferred thermochromic material for use in accordance with the present invention changes colour between 44°C and 58°C, so that the intensity at the colour of the thermochromic material begins to decrease at 44°C and

is at its minimum intensity at 58°C. Therefore, during the entire colour change of the thermochromic material, the wax is at an appropriate temperature for application to the body. However, it will be appreciated that thermochromic materials that change colour over other temperature ranges within the temperature range of 40°C and 60°C are also appropriate. For example, a thermochromic material could be selected which changed colour between 40°C and 50°C, as again, during the entire colour change, the wax could be used safely. Also, the thermochromic material must be compatible with the material of the container or device and should not leach from the container or device into the molten wax.

Suitable thermochromic materials may be found, for example, amongst those described in US Patent No 4,717,710. The thermochromic materials used in accordance with the present invention change colour over a wide span of temperature, for example over a temperature range of about 5 to 20°C, and most preferably over a temperature range of about 8 to 15°C. For example, as noted above, a preferred thermochromic material for use in accordance with the present invention changes colour between 44°C and 58°C, that is over a temperature range of 14°C. However, many other thermochromic materials can be used in accordance with the present invention which change colour over different temperature ranges, provided that they show a colour change within a

temperature range which is suitable for providing an indication that the wax in a container is at an appropriate temperature for application to the skin.

Further, the choice of material for the wax container or the device for use therewith is not especially limited, provided that the material is resistant to the temperatures employed on melting the wax. Also, the material of the container or device should be compatible with the chosen thermochromic material. In addition, if it is desired that the thermochromic material is included in a device adapted to be used as a stirring means, the material of the device should have appropriate mechanical and chemical properties, that is, it should be sufficiently rigid to act as an effective stirrer. For example, the container for the epilatory wax may be comprised of a plastics material and the device for use therewith may be comprised of wood or a plastics material, for example.

The temperature range within which the container or device changes colour will be selected depending on the properties (in particular the melting point) of the particular wax used. However, the most important indication is that the wax is not too hot and will not therefore burn the skin. As waxes should not be applied to the skin at temperatures in excess of about 58°C, the container or device should therefore show a colour change below that temperature.

In a preferred variation of the invention, the device comprises a wooden spatula, on which is printed a printing ink which contains a thermochromic material. Thus, the spatula will initially have, for example, writing or a pictorial design printed thereon. Wax is most preferably used between about 45°C and 56°C, at which temperature, it spreads correctly on the body and will not burn the skin. Therefore, for example, a thermochromic material may be incorporated into the printing ink on the spatula which starts to lose its colour at about 44°C and is completely colourless at about 58°C. Thus, the print on the spatula will start to disappear gradually in accordance with the temperature rise and will have disappeared completely at 58°C, although the consumer will probably cease to see the writing at about 56°C due to the coating of the spatula with the wax composition. Therefore, when the print has disappeared, there is a clear indication provided to the consumer that the wax is too hot to be applied to the skin, and should be allowed to cool slightly, that is, until the print reappears on the spatula. Whereas, if the consumer can see the print, the wax can be used safely.

In a further variation of the invention, the device comprises a plastic spatula which incorporates a thermochromic material. Preferably, the resin concentrate is present in an amount of about 10% of

the overall polymer weight of the spatula. The spatula will exhibit one colour at low temperature, but the intensity of this colour will decrease in accordance with a temperature rise, until the spatula becomes a different colour at a predetermined temperature. For example, the spatula may contain a thermochromic resin concentrate which is initially blue, but which begins to lose its blue colour at about 44°C and becomes completely colourless at 58°C. In use, when the spatula reaches 58°C, the thermochromic material has lost its blue colour entirely and the spatula becomes white. Thus, when the spatula is colourless, there is a clear indication provided to the consumer that the wax is too hot and must be allowed to cool slightly, that is, until the spatula regains some of its blue colour. Also, the consumer will know that the wax is safe to use provided the spatula is blue, even if the blue colour is of low intensity. The spatula will gradually lose its blue colour over a temperature range between about 44°C and 58°C, during all of which time the wax is at an appropriate temperature for application to the body.

When the wax is contained in a bottle which has an applicator device to enable the wax to be discharged from the container directly onto the skin of the user, the thermochromic material may preferably be included in the said applicator. Prior to use of the wax, the container is inverted so that the wax can flow out of

the container via the outlet of the applicator device. If the colour change of the thermochromic material in the applicator indicates that the wax is too hot for application to the skin, the consumer will know that the wax should be allowed to cool slightly prior to use.

In a further variation of the invention, the walls and/or lid of the wax container contain a thermochromic resin concentrate, which is adapted to change colour within a temperature range between about 40°C and 60°C. For example, the colour of the wax bottle or jar and/or its lid may be red when the container is at low temperature, but the intensity of this colour may begin to decrease at about 40°C and the container may have lost its red colour entirely at about 50°C. When the thermochromic material is incorporated only into the lid of a wax container, it will be necessary to invert the container after heating so that the molten wax is in contact with the part of the container which contains the thermochromic material. Then, according to the colour of the lid of the container, the consumer will know whether or not the wax in the container is too hot for application to the skin.

It will also be readily appreciated that the container or device may incorporate more than one thermochromic material, where desired. Thus, the container or device may change from a first colour to

a second colour near the melting point of the wax and from the second colour to a third colour when the wax is too hot. For example, two thermochromic materials may be incorporated into the container of wax or the device for use therewith, so that one colour is observed when the wax is not hot enough, a second colour is observed when the wax is at the correct temperature for use and a third colour is observed when the wax is too hot for use.

CLAIMS

1. A container for an epilatory wax composition and/or a device for use in conjunction therewith, wherein the container and/or the device includes a thermochromic material adapted to change colour over a predetermined temperature range when in contact with a melting or molten wax composition.

2. A container and/or device as claimed in claim 1, wherein the thermochromic material changes colour within a temperature range between 40°C and 60°C.

3. A container and/or device as claimed in claim 2, wherein the thermochromic material changes colour between 44°C and 58°C.

4. A container and/or device as claimed in claim 1 or claim 2, wherein the thermochromic material changes colour over a temperature range of between 5 and 20°C.

5. A container and/or device as claimed in claim 4, wherein the thermochromic material changes colour over a temperature range of between 8 and 15°C.

6. A device as claimed in any of claims 1 to 5, wherein the device comprises an applicator.

7. A device as claimed in claim 6, wherein the applicator is a spatula comprised of wood or a plastics material.

8. A container as claimed in any of claims 1 to 5, wherein the thermochromic material is included in the lid of the container.

9. An apparatus for the removal of hair from the body comprising a container of an epilatory wax composition, which wax is adapted to melt on heating, and a device for use in conjunction therewith, which device is adapted to make contact with the melting or molten wax composition, wherein the device includes a thermochromic material adapted to change colour over a predetermined temperature range when in contact with the wax composition.

10. An apparatus as claimed in claim 9, wherein the epilatory wax comprises a sugar-based composition.

11. A method of removing hair from the body, which method includes the steps of providing a container of epilatory wax, wherein the container and/or a device adapted for use in conjunction therewith is adapted to change colour over a predetermined temperature range; heating the wax until the container and/or device changes colour; applying the wax to the body and removing the wax together with the unwanted hair.

The Patent Office

16

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Claims searched: 1-11

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Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

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Int Cl (Ed.6): B65D 23/16, 51/24; A61J 9/02; G01K 11/12, 13/00

Other: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
P, Y	EP 0752221 A1	(PHYTOLAB) - whole doc.	1
Y	US 4919983 A	(FREMIN) - col 2 lines 20-24.	1

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.